its later variant was the Vickers.[15] Both weapons could fire a .303 in. or 7.92 mm cartridge at a rate of 450 to 550 round per minute (RPM). In WW I these guns fundamentally changed the nature of battle. Some of these weapons may still be in use today.

It was only a matter of time before the attributes of the crew served medium or heavy machine gun were incorporated into such personal, rapid fire small arms such as the pistol, the sub-machine gun, the self loading rifle, the assault rifle and the light machine gun of today. While some initial research and development (R&D) took place in the late 19th century, it was the experience of WW I that provided the major impetus for this development. There are many references which cover the development of these weapons (including the characteristics of countless variants).[16] Initially these small arms were seen as specialist weapons and were issued only to soldiers in units deemed to require them. All semi-automatic and automatic firearms[17] use the energy created by the firing of a round to operate through one of three different methods – recoil (short or long), gas pressure, or blowback. Each has its own advantages and disadvantages, depending on the role of the weapon. Throughout WW I and WW II, the standard infantry personal weapon was the bolt action or box magazine-fed rifle. The US Army was the first to issue a semi-automatic rifle (the self loading rifle, or SLR) as a standard issue weapon. The M1 Garand was a .30 in. caliber gas-operated rifle that could fire effectively at a rate of 20 RPM. It first saw service in WW II. As with most military weapons, a number of subsequent improvements were made to this rifle, many as a result of the hard lessons of combat. The final rifle of the series, the M14, saw service in Vietnam. It was eventually replaced by the M16 and such current variants as the M16A2.

It should be noted that firearms development over the years has not been exclusively a case of military development influencing or leading civilian development. In the early years of small arms development, civilian innovations and requirements often paved the way for changes to weapons. This was certainly the case up until the end of the 19th century as firearms developments did not necessarily distinguish between civilian and military requirements, and there were often no regulations in democracies to restrict civilian ownership of military weapons. Even now, pressures for improvements in firearms remain something of a two way street, with both military and civilian manufacturers contributing to one another's requirements

---

[15] *Ibid*, p. 83.

[16] See footnote 9.

[17] A semi-automatic self loading rifle (SLR) requires the trigger to be pulled each time a cartridge is to be fired. An automatic firearm will fire bullets continuously, at various rates of fire [usually 600 – 1000 RPM] depending on the firearm, limited of course by magazine capacity, as long as the trigger is held. Moving an internal sear pin determines whether the weapon fires fully automatic or semi-automatic. Most automatic firearms enable the user to select an automatic or semi-automatic function through the use of an external lever catch which changes the position of the sear. In some cases semi-automatic firearms not manufactured to fire automatic, particularly those designed for military use, can be modified by a gunsmith/armourer to fire automatic.